

Appl. No. 09/706,937

Amdt. dated November 20, 2006

Reply to office action of June 28, 2006

**REMARKS**

This amendment accompanies the filing of a REQUEST FOR CONTINUED EXAMINATION following a Final Office Action mailed on June 28, 2006. The Office Action objected Claims 4 and 5 because of informalities. The Office Action rejected Claims 11 and 14 as being anticipated by U.S. Pat. No. 6,684,219 ("Shaw"). The Office Action rejected Claims 1, 4-6, 8-10 and 15 as being obvious in view of the combination of Shaw and U.S. Pat. No. 5,974,419 ("Ashby"), rejected Claims 12 and 13 as obvious in view of the combination of Shaw and U.S. Pat. No. 5,930,474 ("Dunworth"), rejected Claim 2 as obvious in view of the combination of Shaw and U.S. Pat. No. 6,470,344 ("Kothuri") and rejected Claim 3 as obvious in view of the combination of Shaw, Ashby and Kothuri.

Applicants have amended Claims 1, 2, 4, 5 and 14. Applicants respectfully request reconsideration of the pending claims in view of the following remarks. Applicants submit that all of the pending claims in the present application are allowable, as explained below.

**Claim Objections**

Claims 4 and 5 were objected to because of informalities. Applicants' have amended to correct the informalities as suggested by the Examiner.

**The Shaw patent**

The Office Action relied upon the Shaw patent, solely or in combination, to reject the pending claims. Briefly, the Shaw patent discloses an object-orientated database. The data structure of Shaw comprises database, library, object and primitive levels with the data at each level being spatially indexed to the data above and below each level. (*see*: Shaw, column 7, lines 51-57). To accomplish this structure, Shaw spatially indexes spatial elements to cluster the data according to spatial proximity and hierarchically indexes non-spatial data based on aggregation hierarchy and inheritance hierarchy inherent in object-oriented schemes. (*see*: Shaw, column 13, lines 47-59). Simply, Shaw uses a separate spatial index for spatial data and a separate non-spatial index for non-spatial data as summarily described in Shaw at column 17, lines 15-21:

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The spatial indexing scheme of quad tree indexing and the non-spatial attribute indexing scheme both are used by the present invention. The quad tree indexing scheme is used to find the vicinity of the sought criteria. Then, the other object-oriented indexing schemes based on attribute (nested index, path index, and multi-index) may be used within the selected vicinity of the searching criteria.

The use of these separate indexes in Shaw is most easily illustrated using the query process shown in Figure 9. First, the user specifies a geographic area of interest at step 91 and the system of Shaw uses the spatial index to search for the area of interest and lists all databases covering the area of interest at step 93. The user selects one of the listed databases (step 94) and the system accesses and lists the libraries (steps 95 & 96) according to the inheritance hierarchy for the listed database using the separate non-spatial index. Similarly, the user selects one of the listed libraries (step 97) and the system accesses and lists the features within the selected library (step 98). Similarly, the user selects one of the listed features (step 99) and the system accesses and lists the objects associated with the selected feature (steps 101 & 102).

Shaw also discloses in its background of the invention section a data structure for Vector Product Format (VPF) geospatial data. A VPF database comprises three types of information for spatial features: locations, attributes and relationships. This information is organized into a hierarchical structure of directories, tables and indices. The root directory contains a number of library subdirectories, each representing a specific geographic region and specific scale. Within each library subdirectory are coverage subdirectories representing a related group of feature classes. Each coverage subdirectory contains tables and indices describing its feature classes by attribute and location. (*see*: Shaw, column 2, lines 27-47). Because the root directory of the VPF database represents a specific geographic region at a specific scale, different VPF structures are created for different geographic areas and scales providing differing levels of features. (*see*: Shaw, column 4, lines 20-30).

#### Independent Claim 1

Applicants' independent Claim 1 relates to an index for a geographic database that represents geographic features. Claim 1 recites a single indexing structure that includes three dimensions. A first dimension includes latitude information, and a second dimension includes longitude information. The data indexed by the structure are searchable using latitude and longitude. A third dimension of the indexing structure includes rank information, and the data

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indexed by the structure are searchable for the rank using the third dimension of said indexing structure. Applicants' independent Claim 1 was rejected as being obvious in view of the combination of Shaw and Ashby. Claim 1 is not obvious because the combination does not disclose all of the elements of this claim.

First, Shaw does not disclose the recited single indexing structure that includes three dimensions with the first and second dimensions includes latitude and longitude boundary information and the third dimension includes rank information. As discussed above, the Shaw system discloses separate indexing structures: one with spatial indexing scheme of the quad tree and another object-orientated indexing scheme for non-spatial information based on attribute. (*see*: Shaw, column 17, lines 5-21). Accordingly, the Shaw system discloses and suggests using two separate indexing structures rather than the recited single indexing structure. Thus, Shaw fails to disclose or suggest the recited claim elements.

Ashby<sup>1</sup> was cited by the Office Action as teaching rank. (*see*: Office Action, page 5). The portion of Ashby cited by the Office Action is similar to the description in the Background of the Invention of the present application. Specifically, each layer with its corresponding rank(s) has a separate index. (*see*: Ashby, column 20, lines 52-53). Accordingly, Ashby does not disclose the recited three dimensional index. Similarly, the background in Shaw discloses different VPF structures for different levels of features. (*see*: Shaw, column 4, lines 20-30). The present invention with its recited single indexing structure is specifically designed to overcome the need for these separate structures for different levels of features as taught by Ashby and Shaw.

Because the combination of Shaw and Ashby fails to disclose or suggest every claim element, Applicants' independent Claim 1 is not obvious in view of the combination.

#### Independent Claim 2

Applicants' independent Claim 2 was rejected as being obvious in view of Shaw and Kothuri. Claim 2 recites a single index structure that includes two spatial dimensions and a non-spatial third dimension, whereby the geographic data indexed by the structure are searchable

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<sup>1</sup> The Ashby patent is assigned to the assignee of the present application, NAVTEQ North America, LLC. To the extent permitted by law, any statements in the present Amendment regarding the disclosure of the Ashby patent should not be used to restrict the scope of claims in the Ashby patent.

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spatially using said two spatial dimensions and the geographic data are searchable for a non-spatial property of the indexed geographic data using the third dimension of the index structure. Claim 2 is not obvious because the combination does not disclose all of the elements of this claim.

First as discussed above, Shaw does not disclose the recited single index structure that includes two spatial dimensions and a non-spatial dimension. In contrast, the Shaw system discloses separate spatial and non-spatial indexing structures. (*see*: Shaw, column 17, lines 5-21). Thus, Shaw fails to disclose or suggest the recited claim elements.

Second, Kothuri was cited by the Office Action as disclosing the k-d tree index structure. (*see*: Office Action, page 10). However, Kothuri also fails to disclose the recited single index structure that includes two spatial dimensions and a non-spatial dimension. As discussed at length in the previous Amendment filed on April 28, 2006, Kothuri clearly states that separate index structures are generated for different selectivities or granularities, such as one index for a city-year granularity and another separate index for a state-year granularity. (*see*: Kothuri, column 6, lines 11-21; column 14, lines 18-33). Kothuri does not include the non-spatial property of rank, granularity or scale information in the single index structure, rather Kothuri teaches separate indexes for different ranks, granularities or scales.

Because Shaw and Kothuri fail to disclose or suggest every claim element, Applicants' independent Claim 2 is not anticipated by this combination.

#### Independent Claim 14

Applicants' independent Claim 14 was rejected as being anticipated by Shaw. Applicants submit that Claim 14 is not anticipated by Shaw for similar reasons as discussed above in conjunction with Claim 1. Claim 14 recites a single indexing structure that includes a first dimension, a second dimension and a third dimension, the data indexed by the indexing structure are searchable using latitude and longitude, and a selectivity of the indexed data is searchable using the third dimension of the indexing structure. Shaw does not disclose the recited single indexing structure. In contrast, the Shaw system discloses separate spatial and non-spatial indexing structures (*see*: Shaw, column 17, lines 5-21) and different VPF structures for different levels of features. (*see*: Shaw, column 4, lines 20-30). Because Shaw fails to disclose or suggest every claim element, Kothuri does not anticipate Applicants' independent Claim 14.

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Dependent Claims 3-6, 8-13 and 15

Applicants' Claims 3-6, 8-13 and 15 are dependent claims that distinguish the cited references at least for the same reasons explained above in connection with their independent base claims. In addition, these claims recite further features and limitations that are neither disclosed nor suggested by these references.


Petition for extension of time

Included with this response is a request for an extension of time to reply to the office action dated June 28, 2006. Included with this response is an authorization for payment of the fee associated with this request.

Conclusion

All the issues in the office action, dated June 28, 2006 have been addressed. Favorable consideration of the present application is requested. If any issues remain, the Examiner is invited to call the undersigned.

Respectfully submitted,



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